

**Indigenous Knowledge & Natural Disaster Preparedness
in Char Land of Bangladesh**

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**A Dissertation
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Abstract

Since the 1970s, evidence that local knowledge and practices can help implementing organisations to improve disaster preparedness activities has grown; notwithstanding this evidence, the marginalisation of local knowledge and practices by mainstream literature and institutions involved with disaster management continues.

A local knowledge system is composed of different knowledge types, practices and beliefs, values, and worldviews. Such systems change constantly under the influence of power relations and cross-scale linkages both within and outside the community. As such, local knowledge and practices need to be understood as adaptive responses to internal and external changes which result (or not) in disaster preparedness at local level. In order to identify local knowledge on disaster preparedness, one should focus on four key aspects: people's ability to observe their local surroundings, people's anticipation of environmental indicators, people's adaptation strategies, and people's ability to communicate about natural disasters within the community and between generations. Overall, the ability a community has to prepare itself for disaster preparedness needs to be understood within the broader context of livelihood security and sustainability and building up community resilience in the long term.

I went to Kurigram to gather knowledge on the topic of my dissertation. After deciding my dissertation topic as 'Indigenous knowledge & disaster preparedness in char area of Bangladesh' I have already gone through few references, books, journals and periodicals. To understand more I have also gone through internet sites also. With the help of my respected supervisor and few other colleagues I have also talked with some knowledgeable persons who have been working in this field of indigenous knowledge & disaster preparedness. I have also talked with few people who have work experiences in char land, environment and climate change projects.

There has been a big difference of understanding between the theories you learned from books and works you do in the field in reality. If a researcher wants to dig

through his/her research question to get the most accurate and true result, there is no other way to get it better than going to the field of reality. That is why my supervisor told me to go to the field as soon as possible to have field research. And as I was planning to go to Kurigram which would fulfill the research needs my supervisor was happy about my site selection also.

Origin of Paper

This entire paper is prepared to satisfy one of the partial requirements of the MDS programme under the supervision of my honorable teacher Dr. Mahbub Alam.

Sources of Paper

In the preparation of this report, most of the information and data were required as mandatory. To full-fill this requirement, data were collected from primary and secondary sources. The primary sources include taking interview of the knowledgeable people in this field of indigenous knowledge and natural disaster, taking interview of the local people living in char areas. Secondary source includes papers, articles, books, and reports both in hard copies & from internet.

Scope

This paper covers the issue which I have identified related with local knowledge and natural disaster as **‘Indigenous Knowledge & Natural Disaster Preparedness in Char Land of Bangladesh’**

Limitations

Although this research part of the paper was completely prepared, but some limitations were observed. Availability of information, easy access to primary data and information, finding right people for additional guidance, unable to take intensive interview of the local char people due to ongoing flood in the northern part of the country, are some to name a few.

Paper preview

The first chapter explains some parameters such as origin, sources, scope and limitations of the whole study. In the second chapter I have talked about the theories related with indigenous knowledge and natural disaster in details. The next chapter

includes some factual details including the interviews of the local char people. In the next chapter some fundamental differences between technical knowledge and local knowledge concept and the following chapter covers the argumentative analysis regarding the research question. Finally, the following chapters include the findings and solutions.

Chapter 1

Introduction

1.1 Introduction

In this chapter I gave emphasis on the brief introduction about the country Bangladesh and the demographic description about the area where I have conducted my research.

1.2 Bangladesh at a glance

Bangladesh is mainly composed of the floodplains and delta of three rivers, the Brahmaputra/Jamuna, Ganges/Padma and Meghna. Bangladesh was, and continues to be, formed by sedimentation and accretion of these rivers as they flow from the Himalayas to the Bay of Bengal. Chars are areas of new land formed through the continual process of erosion and deposition in the major rivers and coastal areas. Some of the island chars are up to 40 years old but others have more recent histories. The whole of the charland is unstable and prone to annual flooding. The Chars are home to some of the poorest and most vulnerable people in Bangladesh.

Bangladesh: At a Glance

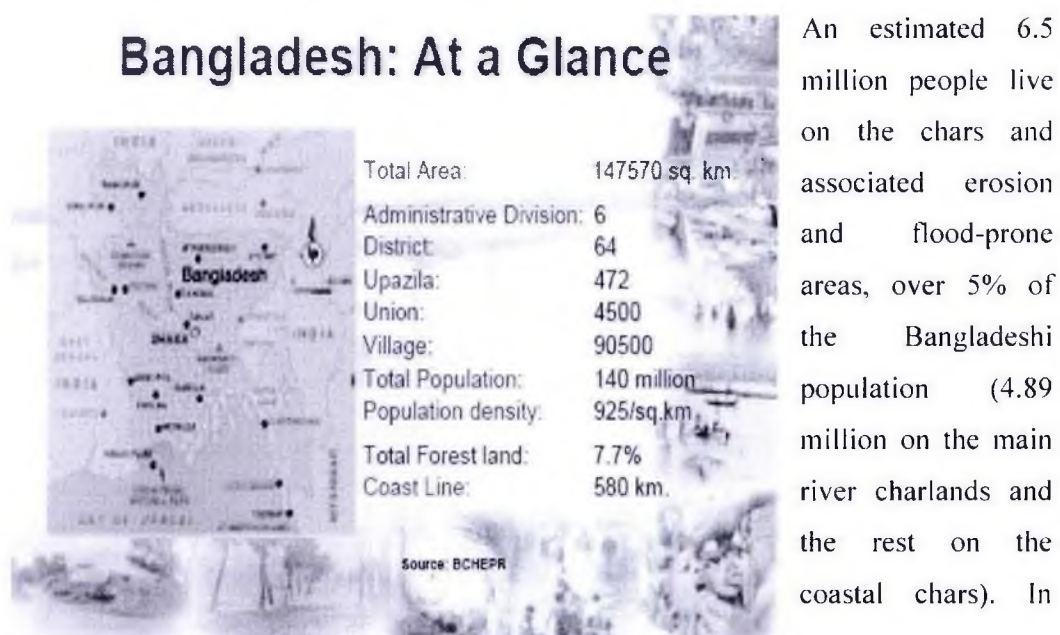


Figure 1: Bangladesh at a glance

addition to the major physical risks associated with the rivers, char-dwellers in particular are marginalized from the benefits of mainland Bangladeshi society through their poor communication networks. This is particularly the case for the 2 million people who live on the island and attached river chars though a further 3 million live on the unprotected riverbanks and experience similar livelihood difficulties.

1.3 Demography of Char Kurigram

Char Kurigram is in Kurigram district. There are around 800 households in this char where the population is around 4,500. People of this char are very poor and most of them are daily or seasonal labours. The people of char Kurigram are very vulnerable to two major natural disasters, i.e. flood & river erosion. People of this char are becoming landless and poor due to the frequently occurring floods and river erosion. In this report I have tried to bring the coping mechanism of the poor char people of char Kurigram during the natural disaster especially when flood occurs in almost every two years.

1.4 Indigenous/local knowledge and disaster preparedness

The current report proposes investigation of natural disasters from a people-centred perspective: that is what the residents know about natural disasters risks and what they believe and do about them in a given situation. As such local knowledge is used here in its broadest sense. We all have local knowledge: it refers to the relationship people develop with their surroundings over time. The terminology is diverse: the literature refers to: 'indigenous knowledge', 'traditional knowledge', 'folk knowledge', 'folk science', and 'citizen science' among others. Indigenous knowledge is part of local knowledge: it refers to:

Local refers to, and emphasises, a place, a region, a location as much as the regular movements between different points (e.g., knowledge related to the routes or different locations of groups of people who migrate on a routine basis such as nomads, commuters, seasonal migrants rather than time (a knowledge that is anterior to another, traditional versus contemporary knowledge). [World Bank 1998]

It is important to learn how people (local and indigenous) in a particular area view and interact with their environment; whether or not they have local knowledge that helps monitor, interpret, and respond to dynamic changes in ecosystems and the resources and services that people generate; and whether or not their knowledge can be used to design appropriate interventions, including disaster preparedness. Local knowledge is dynamic and is always changing over time through experimentation and adaptation to environmental and socioeconomic changes. [World Bank 1998]

Disaster preparedness refers to a combination of short- and long-term strategies that help minimise or reduce the negative effects of natural disasters, prevent their impacts on assets, and escape certain peak values (e.g., during periods of excessive rainfall, etc) or their consequences. As such disaster preparedness is defined broadly and goes well beyond emergency preparedness which is used by nations to refer to crisis management based on command-and-control (civil defense) and short-term response strategies. It is difficult to isolate disaster preparedness from other components of disaster management (e.g., disaster relief) as they are inter-related. [World Bank 1998]

1.5 Conclusion

I have tried to introduce the readers to my topic and also gave brief description of the demographic area to have thorough understanding of the whole literature in this chapter. The following chapter will be about the concepts and theories of local/indigenous knowledge & disaster preparedness.

Chapter 2

Concepts of local knowledge & disaster preparedness

2.1 Introduction

This chapter will emphasise on the concepts of indigenous/local knowledge & disaster preparedness. This chapter will also talk about the vulnerability and the poverty issue of the char people during natural disaster

2.2 What is a disaster?

We use the term 'disaster' often in our everyday lives. It seems that anything from missing the bus to a lost football game can be a 'disaster'. At the same time we constantly see and hear events such as earthquakes, nuclear accidents or environmental degradation being described as disasters. What then is a disaster?

A disaster can be defined as an event that occurs when a disaster affects a vulnerable Population or area. Disasters are often portrayed using the following equation:

Disaster = disaster * vulnerability

As this equation shows, the two key elements to a disaster: disaster and vulnerability.

2.3 Form of disaster

Disasters come in a number of forms:

- Natural disasters. These include hydro meteorological (e.g. Cyclones, floods), geological (e.g. Earthquakes, volcanoes) and biological (e.g. Epidemics, locust swarms).
- Technological disasters (e.g. Gas leaks, industrial accidents, bridge or building collapses).
- Environmental disasters (e.g. Sea level rise, desertification, and climate change).

A disaster alone will not cause a disaster. Disasters have to impact on a population or area before they can have disastrous effects. For example, a tsunami traveling over open-ocean is not a disaster, but when it strikes a population located on a coastline, the results can be disastrous. [Rashid 1995]

2.4 What makes a disaster?

2.4.1 Disasters and disaster risk reduction

A disaster is a severe disruption to a community's survival and livelihood systems, resulting from people's vulnerability to disaster impacts and involving loss of life and/or property on a scale which overwhelms their capacity to cope unaided. This means that disasters – even so-called 'natural disasters' – are not exogenous and uncontrollable events, temporarily departing from normality, though they are often seen as such. Disasters can be reduced, and in some instances even prevented, by supporting people's ability to resist disaster impacts, for example by promoting seismic resistance in building design or construction of cyclone shelters. To achieve this, human vulnerability and its longer-term societal origins need to be centre-stage in our approaches to disasters. *Disaster risk reduction* entails measures to curb disaster losses by addressing disasters and people's vulnerability to them. Good disaster risk reduction happens well before disasters strike, but also continues after a disaster, building resilience to future disasters. [Rashid 1995]

2.4.2 A diversity of disasters

Disasters come in all shapes and sizes. This briefing focuses on 'natural' disasters – those that are weather related or geophysical in origin. Yet some 'natural' disasters are partly human-induced, such as storms or droughts influenced by global warming or landslides caused by deforestation. The disasters associated with them reflect a complex interplay between these disasters and factors leading to human vulnerability, and are anything but 'natural'. Moreover 'natural' disasters cannot be considered in isolation from other disaster types. Their interactions with epidemics, human impacts on the environment, including 'technological' disasters, and conflict is also of critical importance. [Hutton. Haque 2005]

2.5 Local knowledge & disaster preparedness

How do we document local knowledge on disaster preparedness? Case studies on local knowledge exist in several fields of study, but usually the links between local knowledge and disaster preparedness are not explicitly made. An assessment of the available literature reveals the absence of a framework through which they may be linked. So there is no better way than to hear from the mouth of local people about their knowledge on natural disaster preparedness.

2.6 Why local knowledge?

2.6.1 Local knowledge and practices have rarely been explored in disaster and disaster literature

Since the 1970s, the importance of accounting for and integrating local knowledge into poverty reduction projects including decision-making processes gained recognition within academia, international development and funding agencies, NGOs, and with policy makers. The interaction between western conventional science and local knowledge is not new and the history of the sciences demonstrates that those two knowledge systems have often been more intertwined than separated. What is new is that local knowledge including indigenous knowledge and practices and knowledge systems are now more widely acknowledged.

Much of the literature on local and indigenous knowledge is dispersed in various fields including anthropology, geography, natural resources management, rural sociology, urban planning, and engineering. However, local knowledge and practices have been barely explored in disaster literature in general – and even less in literature on disaster preparedness. Until recently much focus was directed towards relief aid, but this is now slowly changing. An example comes from the impact of the 2004 tsunami in South Asia. Following the disaster, the media especially reported how some communities managed to save their lives and property using local knowledge through the ability to identify early warning signals of the tsunami from local songs and observed changes in animal behavior patterns. The failure of relief aid following

the 2004 tsunami is now largely attributed to a general misunderstanding of people's needs and practices. However, even if implementing organisations acknowledge the existence and importance of local knowledge and practices related to disaster preparedness, there is little documented evidence of their inclusion in disaster preparedness planning. [Hutton. Haque 2005]

2.6.2 A better understanding of local knowledge can help implementing organisations to empower communities for improved disasters preparedness

Accounting for local knowledge, practices, and contexts can help implementing organisations, to better plan for disaster preparedness. It can contribute to project performance in the local area; that is, build project acceptance, ownership, and sustainability. Many implementing organisations do not have a clear understanding of (1) the value of local knowledge for their projects' success and sustainability, (2) the meaning of local knowledge on disaster preparedness, and (3) the methods to identify and collect information related to it.

Understanding, accounting for, and respecting local knowledge can contribute to project cost-effectiveness in the long-term, both from a financial and from a social point of view. Solutions in the context of resources management need to go beyond the dichotomy between local versus state management levels and to integrate cross-scale institutions. As the rate of change (institutional, economic, and cultural) related to globalisation processes is increasing, new and innovative forms of governance are required to address the complexities and uncertainties associated with it. A better understanding of local knowledge and practices can help to identify what is important and can be promoted at the local level. Building upon local knowledge and practices that is capitalizing on local strengths whenever relevant can decrease dependencies on external aid. On the other hand and from a social point of view accounting for local knowledge and practices can contribute to a build up of mutual trust, acceptability, common understanding, and community sense of ownership and self-confidence. Understanding and accounting for local knowledge, practices, and contexts can help community-based organisations tailor their project activities and communication

strategies. They can also act as intermediary organisations able to translate messages from governmental levels to communities in a way that is understandable and trusted by the communities. [Hutton. Haque 2005]

2.7 Conclusion

Disasters are enforceable. Human being cannot prevent disaster like flood and cyclone. But with the help of indigenous/local knowledge we can minimise the effect of natural disasters. The above part was only the introduction to the concepts of local knowledge and disaster preparedness. I will be talking about the methodology used in my research in the following chapter.

Chapter 3

Methodology

3.1 Introduction

This chapter will be focusing on the methodology used conducting the research. While describing the methodology I have gone into details where step by step process has been written down.

3.2 How the information has been collected?

Collecting information on local knowledge related to disaster preparedness involves four major steps: (1) understanding the nature of local knowledge; (2) understanding how local knowledge is being (or not being) produced, used, transmitted, and adapted; (3) understanding the four pillars of local knowledge on disaster preparedness; and (4) understanding the wider context, that is the linkages between local knowledge, disaster management, sustainable livelihoods, and poverty reduction. [Nasreen 2004]

No way can this thesis be described as a quantitative research. From the very beginning my supervisor guided me to work on a topic which will emphasis on the relationship among the local knowledge and disaster preparedness in the char area of Bangladesh. And he also insisted to do this research in a qualitative way. This is why I did not prepare any survey questionnaire for the interviewees. Whether I went to the char areas and try to observe them and their livelihood pattern for two days to have close relationship with them.

After two days I interviewed them with open ended discussion. I also arranged few group discussion separately (male group, female group, mixed group, elder group). I took a voice recorder with me and taking prior permission from them I recorded the discussions. Few of the discussions went for more than hour. I played the part as

moderator but not as typical facilitator. If they were out of track too much only then I tried to take them back into the discussion.

After collecting the data I summaries those and submitted to my supervisor. My supervisor gave me feedback and then I again went to those areas to feel up the gaps of information which were needed to fulfill my thesis. I also took pictures of few coping mechanisms and their livelihood system for better understanding.

3.2.1 Understanding the nature of local knowledge – Step 1

What people know is influenced by, and influences, what people do and do not do, and what people believe in. To understand local knowledge one has to understand and account for people's various ways of knowing as much as people's practices and beliefs. In this report, we use the term 'local knowledge' in the broadest sense to include each dimension: knowledge types, practices, and beliefs because these dimensions are closely interrelated. As such, the nature of local knowledge tends to be more holistic than other forms of knowledge in the sense that it is highly embedded in people's livelihoods. 'Indigenous knowledge' is part of 'local knowledge'.

Firstly, with respect to knowledge types – Local knowledge is often associated with local technical knowledge probably because it is the most visible/concrete aspect of local knowledge. Technical local knowledge includes, for instance, local methods of construction, use and combination of specific local materials for houses, retaining walls, terraces, and so on. Additionally, many other types of local knowledge exist (e.g., ecological, social, and historical knowledge). For instance, local ecological knowledge provides local methods such as agro forestry and poly culture which can contribute to conservation of ecological diversity. Local non-technical knowledge is often not easily identifiable by outsiders because it is closely embedded in people's livelihoods and worldviews. Local knowledge is scattered and institutionally dispersed: it is located at the individual/household level as well as collectively through community stewards and other key social actors. One can also make a distinction between everyday knowledge about the environment and specialist

knowledge retained by a few individuals or local experts. Local knowledge also tends to derive more from memory, intuition, and the senses than from the intellect. Finally, another distinction can be made between experiential knowledge (i.e., knowledge gained through experience) and transmitted knowledge (i.e., knowledge gained through transmission from stories, poems, songs, and religious practices, for example). Obviously local knowledge is always a mixture of the two. However, transmitted knowledge does not meet with the same problems of legitimacy in the community as experiential knowledge.

Secondly, with respect to local practices, institutions, and skills – In the literature, local practices are also referred to as ‘risk-spreading strategies’, ‘preventive measures’, ‘adaptation strategies’, ‘coping strategies’, ‘adjustment strategies’, ‘safety nets’, and so on. Local practices are mediated by local institutions and associated



Figure 2: Group of women of char Kurigram

what circumstances. At the local level, various types of institutions exist. For instance, institutions can be classified in terms of social, religious, political, judicial, and economic institutions or in terms of familial, communal, social, and collective institutions. Examples of local institutions are: the family, the household, marriage, the caste system, kinship exchange networks, traditional rural reciprocity networks, schools, and so on. Institutions shape every aspect of a livelihood system from the type and amount of assets individuals, households, and organisations can build upon,

power relations. Local institutions constitute a set of formal and informal rules, norms, values, organisations, and patterns of behavior that define who is allowed to use what kind of assets (i.e., natural, socio cultural, economic, political) at what time and under

together with the creation, transformation of, access to, returns from, and accumulation or reduction of assets to their livelihood strategies (e.g., whether people manage to diversify, innovate, intensify), their livelihood outcomes (e.g., whether people manage to increase social services or promote a certain type of rights), and the 'vulnerability context' (e.g., crisis, shocks, trends) that people face. Several reasons why institutions matter. First, "institutions shape the patterns of human interactions and the results that individuals achieve" through monitoring, sanctioning, and conflict resolution mechanisms for instance. Second, institutions can increase and/or decrease the benefits from a fixed set of inputs. Third, "institutions shape human behavior through their impact on incentives". Incentives are rules, norms, values that control material, energy, and information flows, and therefore livelihood decisions and strategies. Local practices and institutions encompass various dimensions. Practices may be different from one level to another. For instance, some local disaster preparedness practices may only be found at the household level while others may only be found at the community/village level. Further, practices may be different from one social group to another.

Thirdly, with respect to local belief systems – Local belief systems are understood here as the combination of people's beliefs (e.g., socio cultural, religious belief systems), worldviews (i.e., ways of perceiving the world), values/moral principles (e.g., respect, reciprocity, sharing, humility), and ethics. Belief systems shape people's understanding, perceptions, and response to natural disasters. Understanding local beliefs, perceptions, and values is crucial therefore because it gives one insight into why people do things the way they do. In that sense, "with some groups, how people say things [and in which context they say things – author] may be more important than what they say" because the outcome can be interpreted in many ways unless you understand the context. In other words, understanding the process is more important than understanding the outcome per se.

As such what is perceived as fatalism is part of a socio cultural and psychological coping response for people who lack individual choice and power. At the same time

not all beliefs are sustainable or relevant. Some values have led to massive environmental degradation and the collapse of entire societies.

3.2.2 Understanding the processes surrounding local knowledge - Step 2

All three dimensions of local knowledge (knowledge types, practices, and beliefs) are interrelated and influence one another constantly. Local knowledge and knowledge in general emerges from a dynamic process of knowledge creation, use, management, and transmission. In fact, local knowledge is disappearing and being created all the time. Before trying to build upon local knowledge and practices, one needs to understand the processes involved. How is local knowledge disappearing and being created? How is local knowledge used in a specific context and by whom? How is local knowledge being transmitted within the community and between generations and who is transmitting it? How local knowledge is managed at the household and community levels? What are the key local institutions that influence knowledge management? Who has access to local knowledge, how, and under which conditions?

The process of knowledge creation itself is complex and includes aspects of internalisation, socialisation, and externalization of knowledge, as well as the combination of one type of knowledge with other types. For the purpose of this report, two important points need to be highlighted. First, the internalisation of practices means that, “local people often have difficulties identifying specific practices or institutions as specifically oriented toward coping with disasters, even though those same practices do play a role in reducing risk. This makes sense given that most of these practices have been developed over centuries of trial and error. Also, some of the very practices that do reduce risk can be remarkably oppressive in other ways. In some cases, for example, they need to create social obligations outside of the community (that can protect households in the event of disaster) leave little options for women when it comes to choosing a marriage partner. They have virtually no voice in the matter, but their enforced silence helps to ensure the security of their natal household (and the household they are married into).

Sometimes, prior experience of a natural disaster is forgotten because the event does not happen frequently enough for people to remember and internalise it. The combination of local knowledge with external knowledge is not new. Communities totally isolated from outside influence are rare. Local knowledge is not isolated: it has always been connected to other places and other types of knowledge.

3.2.3 Understanding the four pillars of local knowledge on disaster preparedness – Step 3

Local knowledge on disaster preparedness relates to four major dimensions of knowledge: observation, anticipation, adjustment, and communication.

Firstly, with respect to observation – Local knowledge on disaster preparedness relates to people's observations of natural disasters through their daily experiences of their local surroundings.

Secondly, with respect to anticipation – Local knowledge on disaster preparedness also relates to people's anticipation of natural disasters through identifying and monitoring local indicators such as early warning and environmental signs of imminent disasters as well as time thresholds, escape routes and safe places for humans and cattle, and key skills, actors, and the roles they play within the community.

Thirdly, with respect to adjustments – Local knowledge on disaster preparedness also relates to people's adjustment strategies through trial and error. It includes aspects of how people cope, adapt, experiment, and innovate in the face of natural disasters and how they learn from previous disasters they have faced. Their capacity to adjust is based on their access to assets (or people's strengths, or capital endowments including human, socio cultural, institutional, financial, economic, political, physical, and natural aspects) which – as mentioned previously – is mediated by local institutions

and influenced by external institutions and global factors and trends. Importantly, not all adjustment strategies are sustainable in the long term.

Fourthly, with respect to communication – Local knowledge on disaster preparedness also relates to the communication strategies about natural disasters among community members and between generations. Here communication refers to the sharing of information related to past and imminent natural disasters. In traditional rural communities, knowledge is usually transferred orally, but not exclusively so. Understanding local knowledge on disaster preparedness therefore requires us to pay attention to informal education and internal learning processes.

3.2.4 Understanding the wider context: the relationship of local knowledge, disaster preparedness, and livelihoods to poverty reduction – Step 4

Local knowledge is influenced by the type, frequency, and intensity of past and present natural disasters, as well as by other shocks and global trends and factors —



Figure 3: Sanitation of Char Area

for instance, the impacts of climate change, globalisation, road construction, and national policies on natural resources. Indeed, in many cases, natural disasters, although constituting an important stress, are not the major stressor faced by communities.

The lack of an explicit connection between local knowledge and disaster management in the literature reflects the lack of linkages between poverty reduction and disaster management, and, more generally, the dominance of a sectoral approach to disaster management. Did we forget that disaster risk reduction is also poverty reduction? The issue of local knowledge on disaster preparedness needs to be understood and integrated into the wider issues of sustainable livelihoods and poverty reduction. Ultimately, improving implementing agencies' understanding of the linkages between

local knowledge and disaster preparedness can help implementing organisations to promote livelihood security and build resilient communities. Local knowledge can be used as a key entry point for this.

3.3 Conclusion

The four steps outlined above can be used as a checklist to verify that you have incorporated the key aspects of local knowledge on disaster preparedness into your project. The next chapter of the report presents the livelihood strategy and vulnerability of char people have been discussed in relation with natural disaster preparedness.

Chapter 4

Livelihood strategy of char people – vulnerability

4.1 Introduction

This chapter emphasises on livelihood strategy and vulnerability of the char people of Kurigram district.

4.2 Connection between Indigenous knowledge and disaster management / preparedness

The lack of an explicit connection between local knowledge and disaster management in the literature reflects the lack of linkages between poverty reduction and disaster management and the dominance of a sectoral approach to disaster management. Did we forget that disaster risk reduction is also poverty reduction? The issue of local knowledge on disaster preparedness needs to be understood and integrated into the wider context of sustainable development, especially issues of sustainable livelihoods and poverty reduction. This will help to bring a long-term perspective into disaster management rather than considering it to be a matter of emergency aid and humanitarian assistance only. Projects focusing on sustainable livelihoods and natural resource management should have a disaster preparedness component if resilient communities are to be built. The practices in everyday life need to be understood. It has been pointed out in regard to women that it is not women per se, but rather what they do in given situations, that have to be understood and the way their responsibilities increase: marginalisation is a long, continual process.

Ultimately, improving the understanding of implementing agencies about local knowledge on disaster preparedness can help them to promote livelihood security and build resilient communities. Local knowledge can be used as a key entry point for this. As such, and in order to provide a more holistic view of disaster management, the framework builds upon the livelihood framework. This is because it is a people

centred approach which is already being used by donor agencies and research and development organisations.

Investigating local knowledge about disaster preparedness from a livelihood perspective means that it cannot be isolated from other cross-cutting issues such as poverty, local control of land and material resources, and equitable participation through empowerment. [ICIMOD, 2007]

4.3 Evolution of vulnerabilities to flash floods



Figure 4: Amena Begum, Kurigram

“We were not poor as we are now. I am from a moderately richer family in Sirajganj district. My father was a rich char dweller in Sirajganj. But due to continuous flood and river erosion we shifted from one char to another for last twenty years. Now I have been living in this char Kurigram for 5-6 years. Every time our land and property destroyed by flood and erosion we have to start building our resources from nil. We were vulnerable, we are vulnerable and we will be vulnerable. Life of a choira (People of char) is always vulnerable. Char people’s life can never be described as settled life.”

Amena Begum, Char Kurigram

“Kisti (Micro Credit) is also another reason behind our poverty, although we somehow manage to survive after the flood because of the Kisti system from different NGOs. During flood we do not have any money left with us to buy food and other necessary materials to survive mainly because of the absence of employment opportunities, as most of us do not have our own land and we work as daily labor or contractual labor in other’s agricultural land. During flood or just after flood water gone we buy food and other staffs in credit from the local grocery shops. But after few days the shopkeepers refuse to give us food items on credit as he needs to survive

in his business as well. So, we take loan from the NGOs if we do not have any outstanding loan. So, it becomes an additional burden for us as we do not have any work to do as earning to repay the credit. On the other hand if we have outstanding loan then the field officer from the NGOs comes on the due date and pressurize us to repay their loan. So, we have to take loan from another NGO or from a businessman on a much higher interest rate. We then find ourselves in a vicious circle from where we cannot get back.”

Amin, Char Kurigram



Figure 5: Dudu Mia, Char Kurigram

“After the flood water gone we sell our labor in advance to the landowners in a much cheaper rate than the usual rate. The richer agricultural land owners take benefits from our vulnerable economical condition and position. So, when we work on their agricultural land all day long after two months of the flood we do not get any money as we have already taken that in advance during the flood or post flood for survival. So, again we caught up a vulnerable situation and having no income and savings we constantly remain poor.”

Dudu Mia, Char Kurigram

A combination of external factors (acting simultaneously, or not, and influencing and re-enforcing each other) often influences people’s vulnerability to flash floods. For instance, some stories illustrate how environmental, demographic, and historical/ political factors have played a major role in changing people’s vulnerability to flash floods. Land scarcity and water access often compel people to stay close to the streams and glaciers (environmental factors). With the growing population, land

fragmentation reduces people's options and their flexibility to choose safe locations and to resettle during the rainy season (demographic factors). In some cases, people used to live in safe places but the local rulers confiscated their land. They were resettled in a vulnerable place and/or they simply lost part of the land upon which they used to fall back during the rainy season (historical and political factors). Stories about land resettlement during the times of former local rulers, or currently following construction of infrastructure, are common in the region. Life stories can provide useful information about local perceptions about floods and changes in people's physical and social vulnerability to floods. This information can help to identify vulnerable groups and individuals that might otherwise be 'invisible'.

4.4 Conclusion

Flash flood and river erosion have been the curse to the people of char land in Bangladesh. Due to these kind of natural disasters the char people have become vulnerable and the livelihood strategy of them also changing time to time. The following chapter will be focusing on the perception of local people of char area about natural disaster.

Chapter 5

Perception of disaster from local people

5.1 Introduction

This chapter will talk about the local people's perception about the natural disasters in the char land of Kurigram district. In this chapter I have given some interesting anecdotes/comments which I collected during the interview/discussions with the local char people.

"External agencies, including government officials and technical people, never listen to local advice!"

Hanif Mia, Age 45, Char Kurigram

5.2 Loss of ignoring the local/indigenous knowledge

Floods and river erosions are frequent events in the Kurigram District of Bangladesh. Most of the time, villagers manage to save their lives. They know how to interpret local environmental signals and where disastrous places are. But on 2002, a school building which was built with the help of a foreign donor agency's fund was shattered by the river erosion happened in one of the char in Kurigram district. That particular donor agency was working in that area in a char livelihood project. They were also working in an education programme in few char area. They were to build few schools as well in those chars. The local community told them to build schools with bamboo, tin and hays. But the foreign agency did not pay attention to the local people's voice. So, they invested a large amount of their fund in building schools with bricks, woods and other permanent and costly materials. And only after two months of building the costly school the heavy rainfall and river erosion shattered it within an hour, which took the life of one person and damaged a million takas of equipment, was not a surprise to the locals.

"We told them twice!" said the leader of a nearby village. "We knew that the immovable object in char areas is waste of money and resources. If they build school with local and cheap materials it would have been saved and the rest of the money can be used for the rehabilitation of the people affected by the river erosion and flash flood."

5.3 Anticipating natural disasters

The villagers had learned from previous experience: they could remember how people died and lost their houses and assets in char areas in major river erosion scenarios in the past. Unfortunately, the donor agency, interested in showing their image, power and capability, neglected local advice.

Local knowledge on disaster preparedness relates to people's observations of natural disasters through their experience of their local surroundings. Many people have direct experience of natural disasters (i.e., they have witnessed natural disasters) and/or indirect experience (i.e., they have been told stories of past natural disasters). Daily observation of local surroundings over generations gives communities' localised knowledge of the history and nature of natural disasters as well as knowledge about changes in their own social and physical vulnerabilities to natural disasters over time. Historical knowledge may include knowledge of the location, time, duration, frequency, intensity, and predictability of previous disasters. Environmental knowledge can include knowledge of the characteristics of natural disasters such as the onset, origin, velocity of water flow, and knowledge of different types of rain. Social knowledge may include knowledge of the impoverishment processes of households following recurrent natural disasters and other stresses and/or knowledge of the ability of some to take opportunities from previous natural disasters. Knowledge related to the observation of natural disasters over generations can be very useful to external organisations in complementing their understanding of localised natural disasters and how they are perceived. It can help them to adjust their information and capacity-building activities to local perceptions of localised disasters and trends – that is the associated perceived changes related to their location,

frequency, and impacts (i.e., how they, and their impacts, are perceived by the communities themselves) which determine how people respond to the disasters.

Local knowledge about disaster preparedness also relates to people's anticipation of natural disasters by identifying, interpreting, and monitoring early warning signs in the local environment. This is especially true for resource- dependent communities because their livelihoods are closely dependent on their ability to observe and read the environment. Indicators of imminent flood disasters can include, for example, the color of the clouds, location, intensity, and frequency of rainfall and unusual sounds, and changes in water flow, water color, wind direction, and vegetation. Some people are able to identify the unusual behavior of wildlife (e.g., ants, birds, rats, mice, and snakes).

Generally, people manage to anticipate natural disasters by making basic emergency plans and identifying time thresholds for saving key belongings and for moving out and to higher locations in the case of floods. People have knowledge of safe settlement areas also and from whom to seek advice and support within the community. However, this ability to observe and monitor environmental signals is weakening today in the char areas, as elsewhere, mainly due to changes in the social system and structure. [ICIMOD, 2007]

5.4 Observing and Experiencing Flash Floods

Local knowledge on disaster preparedness in the char areas of Kurigram District of Bangladesh includes aspects related to people's observation and experience of floods, anticipation of floods, adjustment strategies, and communication strategies.

The people of the char of Kurigram have knowledge about the history and nature of floods in their own locality based on daily observation of their local surroundings, close ties to their environment for survival, and an accumulated understanding of their environment through generations. They have learned to interpret their landscape and

the physical indicators of past floods. They can also describe and explain how their own vulnerability to floods has changed over time.

5.5 History of floods in Chars of Kurigram



Figure 6: Hasina, Char Kurigram

"It was 4 pm on that day when the flood started. It was raining heavily here in the village for last one week. Thunders were striking continuously on the western sky and the sound level of the thunder strikes was much louder than usual. We also observed that dirty things were carrying from India through river water which usually does not happen. Birds were not chirping as usual as well. We thought that this year flood will not happen, as the water level was increasing slowly".

Hasina, Char Kurigram

"We were ready to take our goats up to the higher pastures when eight days of continuous heavy rain fell from. We shifted our animals and family members (women, children and elder people) during that period to a nearby village to our relative's houses. After eighth days, the river started to build up in the main course and to spill over. Some houses were destroyed. On ninth day even more houses were destroyed. The main flow came during the night of the ninth days of heavy rainfall".



Figure 7: Amin, Char Kurigram

The water slowly started to flow continuously over the low lands and the water started to cover the land and people had to run away from their houses. In the village, people wondered how it had happened because although it was raining before the flood continuously but the water level was much lower than the danger level for a long period of time. But the people found out that in twenty

four hours time the flood water level rose much higher than the danger level.

"We didn't know the flood was coming because this type of heavy rainfall happens at least twice or thrice in every year during the rainy season! And also we have identified that the flood always occurs in the even year (1988, 1998, and 2000) in this area, and as this is an odd year (2001) so there is no chance of occurring flood. But one man remembers: "Such a flood happened during our grandparents' time but we never expected such an event."

Amin, Char Kurigram

"In the past we stay till the end when it was raining heavily for a long time but now we have stopped doing that. Now we try to listen to the radio for information from the government and other related agencies and observe the environment more closely and carefully."

Most people have scant knowledge of floods they learn about second hand, especially if they happened before they were born, if oral tradition is weak, and if knowledge is not transmitted frequently enough. Stories demonstrate how, in some cases, prior floods have been forgotten because floods of great magnitude do not occur frequently enough in one place (i.e., more than once in a generation) for villagers to remember them (from one generation to another) and for this to influence their decision-making regarding settlement.

5.6 Conclusion

The above discussions show how frequency of floods influences people's capacity to remember disasters and how transmitted knowledge is probably more 'porous' than experiential knowledge. And now the next chapter will talk about relationship between indigenous knowledge & disaster preparedness.

Chapter 6

Indigenous knowledge & disaster preparedness

6.1 Introduction

This chapter will talk about the connection between indigenous knowledge & disaster preparedness in the char land of Kurigram district.

6.2 Indigenous knowledge in disaster preparedness

One of the most extreme forms of adaptation to natural disasters – is perhaps that found in the char lands of Bangladesh. There, people have adapted to the constant change of river courses which erodes land and creates new land constantly. Local knowledge on disaster preparedness also relates to people's adjustment strategies through trial and error. Knowing how to respond to change may include how people cope, adapt, experiment, and innovate in the face of natural disasters and how they learn from previous disasters they have faced (e.g., which plant to conserve and protect for land and water management or where to find wood and water in times of crisis). Their capacity to adjust is based on their access to, and benefit from, assets (or people's strengths, or capital endowments which – as mentioned previously – are mediated by local institutions and influenced by external institutions and global factors and trends). Categories of assets include the human, socio cultural, institutional, financial, economic, political, physical, and natural.

6.2.1 With respect to human assets

Examples of skills that can contribute to natural disaster preparedness include knowing how to swim (in flood-prone areas), knowledge related to carpentry, masonry, and bamboo weaving (e.g., construction of elevated platforms to keep key belongings and small livestock safe from floods ('machhan'), earthquake resistant houses, communication skills (local singers who used to raise awareness about past disasters in the community), ability to speak in public and convey messages, and others. The community also trusts some people more than others, because of their

specific skills and ability to ‘read’ the landscape, the sky, and other elements of the environment, and their advice is followed. Nowadays, economic change (remittances for jobs outside the village) and changes in the education system (the young ones do not value the ‘old’ skills) result in the weakening of traditional skills.

6.2.2 With respect to socio cultural assets

Different people in the same community have different types of knowledge depending upon occupation, physical ability, ethnicity, gender, caste, class and age, as well as their family history, their skills, and/or specific gifts. It discusses women’s subsistence activities in this context. Coping practices are often based on strong social networks and ties grounded in solidarity, sharing, and reciprocity, which help communities and households in the face of natural disasters and disasters.



Figure 8: Housing pattern of Char in Kurigram

around the villages that fulfill religious, economic, and social purposes. These are critical for ensuring effective community monitoring of the local environment and the sustainable use of community resources.

With respect to institutional assets –

Institutional assets may include such things as local, informal conflict resolution mechanisms, informal land tenure and natural resource management rules, and various other institutions in and

6.2.3 With respect to financial assets

Financial assets include cash savings, equity in property and possessions, and access to credit. Such assets may help a community and its households to recover more

quickly following a disaster. Often access to credit and savings is very limited for the most vulnerable groups in a community. Furthermore, only a few people might have the entrepreneurial skills to make good use of financial assets. This means that improving access to micro-credit and savings may not always transfer into improved benefits for those most in need. As suggested elsewhere, entrepreneurship may have to be taught.

6.2.4 With respect to economic assets

The most common or widespread response in the face of recurrent natural disaster risks is for men to seek jobs outside the village (remittances). Seasonal and permanent migration is a common strategy to help people cope with different kinds of stress, including natural disasters, and thus provide economic resilience. Men go out to make money to advance their families economically and, in the process, it may help buffer some of the effects of natural disasters. It enables households to compensate for the loss of income caused by damage to agricultural land from natural disasters. In this context, remittances contribute to economic diversification and are a mechanism for (social and economic) risk sharing and providing insurance against floods

6.2.5 With respect to political assets

Political assets can refer to the role of key local leaders and their personal and professional networks outside the char area, in initiating and influencing community initiatives in disaster preparedness, and in building linkages with external organisations to give voice to their issues, including the threats from natural disasters and mitigation measures.

6.2.6 With respect to physical assets

Physical assets refer to infrastructural safety arrangements such as boats, housing, embankments, food stores, terraces, and retaining walls to minimise the impacts of natural disasters.

6.2.7 With respect to natural assets

Natural assets include the natural resources available to the community and management strategies associated with them that can minimize the impact of natural disasters, especially in the long term (e.g., land arrangements, landscape management,

“Farmers often cultivate a mixed range of grains of which they know some will do well if there is not enough rain, although in normal circumstances they might be less productive.”

6.2.8 Other

Another strategy for spreading risks is to rely on dispersed landholdings. If a flood damages one field, for example, the landowner can still fall back on other fields located elsewhere. However, in most cases, only the richest people have dispersed landholdings. The use of different types of traditional crops resistant to floods has been widely documented in Bangladesh. In the Jamuna flood plain, farmers have learned to adjust their agricultural rice cropping patterns to recurrent floods. The inter-culture of ‘aman’ and ‘aush’ is a risk-spreading strategy: the former variety can grow during abnormal floods while the latter resists drought.

All these assets are inter-related. As such, this classification is only one option among others. For example, ensuring seed security raises questions of resources, land access, organisation, and seed storage technology. Or, natural insurance can also serve as financial insurance during crises (e.g., sale of wood and charcoal) and informal leaders can contribute or not to promoting these aspects through their networks outside of the village. Local institutions governing access to and use of land can contribute to tenure, security, and disincentives for investments in natural resource management. Adjustment strategies to natural disasters can be more broadly classified into technical and non-structural measures, which often build upon a combination of the assets listed above. Ultimately, household and community adaptation are complex processes based on the ability to experiment, innovate, learn, and share the lessons

learned. Investigating household and community assets can provide implementing organisations with an entry point for unfolding this complexity.

6.3 Communication in disaster preparedness:

Local knowledge on disaster preparedness also includes the way people communicate among their peers and between generations. In traditional rural communities, knowledge is usually, but not exclusively, transferred orally. Understanding local knowledge about disaster preparedness requires us to pay attention to informal education and internal learning processes. How is local knowledge used in a specific context and who uses it? How is local knowledge transmitted within the community and between generations and who is transmitting it? How local knowledge is used at household and community levels? Who has access to local knowledge, how, and under what conditions?

The process of knowledge creation itself is complex and includes aspects of internalisation, socialisation, and externalisation of knowledge, as well as the combination of one type of knowledge with other types. In many societies with oral traditions, past events, including flood events, are embedded in individual and collective memory through stories, songs, poems, proverbs, worship, ceremonies, and rituals. These activities serve as a way of communicating in time (between different generations) and in space (from place to place). Various studies in anthropology and human ecology have shown how rituals and taboo are the transformation of social memory into practical resource and ecosystem management. Worship, stories, songs, and proverbs not only help people to remember past events but also help them to convey messages in an attractive and convincing manner. Local songs and proverbs also help to turn abstract events into something more vivid and concrete. The younger generation may not have faced a major flood, and it is difficult for them to understand what it means and to consider it possible in the future. Today, local singers are disappearing from the villages due to modernisation of media, globalisation processes (i.e., access to radio and for the better-off television), and livelihood diversification (getting jobs outside the village).

6.4 Coping mechanism of the char people:

Knowledge of how vulnerable people respond to a threat is essential. Outside interventions can then be built on these strategies.

Natural disasters are not new and people have been living in disaster-prone areas for centuries – in some cases for thousands of years. They have, inevitably, devised their own methods for protecting themselves and their livelihoods. These methods are based on their own skills and resources, as well as their experiences. Their knowledge systems, skills and technologies are usually referred to under the heading of 'indigenous knowledge'. There are now many studies of this in particular contexts.



The application of indigenous knowledge in the face of disasters and other threats is referred to as a 'coping mechanism' or 'coping strategy' (also sometimes known as an 'adjustment' mechanism or strategy and in some circumstances as a

Figure 9: Movable Cooker (Tola Chula) in Char Kurigram
'survival' strategy). The choice of skills and resources to be applied varies according to the nature of the disaster threat, the capacities available to deal with it, and to a variety of community and individual priorities that can change during the course of a disaster.

Indigenous knowledge is wide-ranging. It includes technical expertise in seed selection and house-building, knowing where to find certain wild foods, economic knowledge of where to buy or sell essential items or find paid work, and knowledge of whom to call upon for assistance. People's resources also include labour, land,

tools, seeds, food stocks, animals, cash, jewellery and other items of value. These can be used up, bought, sold, or requested by calling upon obligations from family, kin, friends or neighbours, according to circumstances.

The enthusiasm for sophisticated technological methods of overcoming disasters has led specialists to overlook and undervalue the effectiveness of local coping strategies and technologies. Conventional wisdom in disaster management pays little attention to local knowledge as a basis for prevention and mitigation. Now, although there is a better appreciation of their merits in some quarters, they are still under-utilised by agencies, including many NGOs.

Coping strategies have been studied most in the case of food security, drought and famine, where disaster specialists have come to appreciate their value. This came about in part from recognition that agencies' orthodox approaches to fighting famine were less than fully effective. Strategies for coping with other natural disasters have not received so much attention, but there is a growing body of evidence to demonstrate the value of these and the circumstances that affect their adoption.

It is important for development and relief/recovery workers to appreciate the extent of such indigenous skills and practices, and to build upon them as far as possible in order to maximise their value. This approach helps to make communities partners in the risk management process. It can also be cost effective because it reduces the need for expensive external interventions. It is more likely to lead to sustainable projects, because the work is based on local expertise and resources.

Old skills, knowledge and technologies are not inherently inadequate. New technical approaches are not automatically superior. This lesson has now been learnt by many in the development arena, notably in agricultural and food security work, although it has taken many years. However, the opposite, romantic, trap of assuming that the older ways are always better than the modern must also be avoided. Instead, one must look for what is appropriate in given conditions.

6.5 Anticipating Floods

People manage to anticipate floods by observing and interpreting warning signals in the local environment. They also manage to make basic emergency plans and to identify time thresholds for saving key belongings and for moving out and higher up, for instance. People also have knowledge of safe settlement areas and from whom to



Figure 10: Char Kurigram

seek advice and support within the community.

6.6 Forecast and early warning signals for flash floods

“The people of the char areas of Kurigram district have a smattering of knowledge about the environmental symptoms of occurring flood. If the char people heard dogs are barking at night after night for continuous days they have a belief that flood or any other natural calamity may happen. When they see polluted things are carried out by the river water more than usual times. If the calendar year is even (jor bochor) and the rainfall is heavy they believe that this year may be flood is happening. When they see heavy pouring of rainfall and the thunder strikes more on the western side of the sky they have a belief that flood is coming.

“We saw black clouds, lightning, and huge thunderstorms above the western sky. Some dust was also starting to rise and we heard the noise of boulders falling and rolling down. We understood that a big flood was coming and we ran away to safety.”

“During last flood which destroyed our houses, cattle and other valuable assets, one of our villager identified that the domestic animals are behaving different than usual. Cattle were not returning to the houses on time as they do usually. They were very calm during the daytime and after sunset they use to become restless. The dogs were barking continuously at night. A few birds were seen and those were not chirping as usual as well”

"A different kind of wind (much colder and much windy) was blowing through out the day before the occurrence of the flood."

"People know when it will rain. They look at the direction of the wind. They were also looking at the direction of the water flow of the river."

"We also knew that the flood was coming because of the typical smell. There is a dirty kind of smell found out during the pre flood time in the char area."

People can identify and monitor natural phenomena related to floods such as the color of the clouds, intensity of rainfall, unusual sounds, and changes in water flow. As such, they have some level of hydrological and meteorological knowledge. Some people are able to identify the unusual movements and appearance of wildlife (ants, birds, rats and mice). Long observation of the sun, the moon, and the stars used to help people make decisions about farming activities. Overall, few people die in flash floods because they have learned from experience to identify and interpret environmental warning signs and signals of flash floods. However property, agricultural fields and irrigation channels, are damaged often. (*"The danger from floods is not so much to life as it is to livelihoods"; "Protecting the land, more than life itself, is the big issue."* One of the interviewee, char Kurigram, July 2007) Today, this ability to observe and monitor environmental signals is weakening partly because the number of men working outside the village is increasing.

6.7 Time thresholds and emergency measures

"Since this event, when it rains heavily we know we have to get ready to run away with our belongings. Most of us have a bag prepared with clothes and other valuable stuffs. We have already shifted all our important things to safer places" (i.e., relatives' places)".

"Now every time it rains we move out of our houses!"

"When it rains heavily we climb higher up because we know that a flood will occur."

"If it is raining heavily at night we stay awake."

"After that event, we began to sleep having at least one person from our family awakened during the heavy and continuous rainfall."

Flash floods are very challenging because they occur, by definition, very rapidly and do not leave much time for preparedness. Use of the time between the observation of key environmental signals and the occurrence of floods is therefore crucial. Households adopt a few simple short-term strategies before the rainy season starts or during heavy rainfall such as saving administrative papers and other belongings with their relatives or with neighbours, moving physically to safer places especially at night, running higher up and staying awake or sleeping with shoes on, and having a 'go-bag' ready. Although most of these simple strategies might seem like 'common sense' or 'universal knowledge', it is important to recognise that people have bounded rationality; that is, people's rationality is limited to their own information and beliefs. For instance, a man interviewed described how his wife ran away from the house as a flash flood was coming but then, seeing many people on the street, decided to go back to get her veil. She was then trapped in the house, but did not die. Her husband likes to believe that the veil saved his wife from the flood; seeing her return to get it as a protection factor rather than a risk. This story illustrates the point that 'running away' when the water starts rising might not always be accepted as common sense depending on religious and cultural beliefs and practices for instance.

6.8 Forms of coping

It is possible to develop quite complex systems for categorising coping strategies and indigenous knowledge. For operational purposes, a simpler typology should be sufficient. This divides coping strategies into four broad categories:

- economic/material;

- technological;
- social/organisational; and
- cultural

Most coping strategies involve elements of all of these, so the typology should not be used artificially to place particular strategies under particular headings. Rather, field workers should regard it as a framework for viewing coping strategies and indigenous knowledge as a whole, thereby ensuring that key elements are not overlooked.

It is also important to remember that coping mechanisms are often used in sequence to respond to different stages of adversity or crisis. This is most apparent during famines, when the emergency is likely to be prolonged, but it can also be observed in more rapid-onset disasters such as floods. External agency response to slow-onset disasters such as drought often comes too late, when communities have already used up most of their strategies and resources.

Using the four-type categorisation above, the following paragraphs show some features of coping strategies and indigenous knowledge in a range of disaster contexts. This should give some idea of the variety of methods that vulnerable people have been using and refining for generations. In the light of such knowledge, which can be gained from participatory vulnerability and capacity analysis, interventions can be designed that reinforce existing coping strategies and prioritise areas where these are weak or under threat.

6.8.1 Economic/material

One of the principal elements in this category is economic diversification. Having more than one source of income (or food) is invaluable during times of stress, when some economic activities become impossible. Members of a rural household engaged in agriculture may undertake other work, such as making and selling handicrafts, carpentry, building or blacksmithing. With urbanisation and globalisation, a growing

number of rural communities are coming to depend on cash remittances from family members who have gone to work in towns and cities, or even in other countries.

Vulnerable households try to store up a 'buffer' of food, grain, livestock and cash that they can draw on in difficult times. During periods of food shortage, they will eat food of poorer quality or eat less food, and look for 'wild foods', such as seeds, nuts, roots and berries. If a crisis becomes acute, they will begin to sell their assets, but sale of livelihood assets (e.g. animals, tools, seeds for planting next year's crop or even land) is seen as a last resort.

Even having a large family can be seen as part of an economic coping strategy because it gives a household additional labour. Savings and credit schemes are often an important component of economic coping strategies.

6.8.2 Technological

This category is quite broad; including land management systems as well as what is more usually thought of as technology, such as building materials and construction methods.

Management of land for food production is an important element. Poor farmers, especially those working marginal or drought-prone lands, prefer mixed cropping, intercropping, kitchen gardens and other practices that reduce the risk of poor harvests by widening the range of individual crops grown. Traditional seed varieties are selected for drought or flood resistance, and for particular locations. Alternative crops may be kept in reserve to plant where others are ruined by floods. Pesticides made from local plants are applied to crops.

An obviously technological approach is the way that housing is adapted to repeated floods. Common adaptations include building houses on stilts so that floodwaters can pass underneath, building them on plinths or platforms of mud or concrete so that they

remain above flood levels, and building escape areas under or on top of roofs. The people of char area have a range of methods for dealing with abnormally high or prolonged monsoon floods. These are based on accommodating themselves to the flooding rather than trying to prevent it. They include building on mounds or mud plinths, having homes of lightweight materials that can be dismantled and moved, building false roofs where goods can be stored and people can live, using beds as a living area when water enters the house, hanging belongings from the roof in jute nets, and investing in movable assets such as animals and boats.

6.8.3 Social/organisational

This heading includes indigenous organisations that provide support in countering disasters: kinship networks, mutual aid and self-help groups. Systems of mutual rights and obligations are part of every household and community's social structure, forming what is sometimes called a 'moral economy'. People who are suffering – from shortage of food for instance – often call upon kin, neighbours, or patrons for help. Labour and food sharing during crises is standard in many societies.

The family is a fundamental social mechanism for reducing risk. Extended kin relations are networks for exchange, mutual assistance and social contact. In times of stress, relatives living outside the immediate community can become particularly important. For instance, some families living on char areas in char Kurigram try to marry their children into families on the mainland so that they will have somewhere to move to should they lose their homes to erosion when the river changes course. Disaster-affected people may also appeal to the wider community for charity. In many communities, gifts or alms are expected at times of hardship.

6.8.4 Cultural

Cultural factors include risk perception and religious views, which are frequently connected. Understanding how people view risk is particularly important. The accumulation and application of knowledge are directed by vulnerable people's

perceptions of the risks they face. As we have seen, vulnerability is made up of multiple risks, not just the threat of disasters.

Risk perceptions will vary greatly between and within communities according to culture, experience and (for poor people especially) the pressure to secure their livelihood. It is very difficult to gain understanding of local views of risk. Simply asking questions about how risk is perceived does not always produce useful insights, because outsiders and local communities are likely to think about and describe risk in very different ways. It is often more constructive to talk to communities about what they do to manage a particular disaster than to discuss risks in general, provided that the full range of risks facing a community is covered in this way. But even this method is likely to miss a great deal.

By spending long periods in communities, talking about and observing their daily lives, anthropologists can sometimes acquire a good understanding of the subject. Observation is valuable, as people's statements of their views can sometimes give a misleading impression of their actual risk perception and risk-avoiding behavior. There is a common assumption among disaster management professionals that many people are fatalistic, regarding disasters as acts of God that cannot be prevented. In many cases, this may not be true. Statements of belief in divine power are not incompatible with taking actions to reduce risk.

Communities have their own way of defining when conditions have worsened so much that they constitute a crisis or disaster. This threshold varies between communities, according to their vulnerabilities and the threats they face. Seasonal flooding is not necessarily seen as a disaster in some places. Crop growing may depend on it, and poor families may supplement their diets with fish that are more readily caught as flood water spreads from the rivers over the fields. The Bengali language has two words for flood: one meaning normal seasonal flooding, the other meaning excessive flooding.

6.9 Limitations of coping strategies

Coping strategies and indigenous knowledge are important in reducing risk. But like any knowledge system, they have their strengths and weaknesses in different contexts and at different times. Local knowledge, skills and coping strategies must be assessed rationally and scientifically on the basis of their effectiveness. This is not a debate between indigenous/traditional and external/scientific/modern systems in themselves, but a question of finding the most appropriate approach for each situation.

For example, in farming systems work, the value of local knowledge (of crops, soils, food preservation, climate, and protection against pests) is now widely recognised, and successful projects build on this. Similarly, local knowledge of indicators of drought and famine is now used effectively as a component of some famine early-warning systems. Research on communities living by the Tista River in Bangladesh has revealed the extent, complexity and robustness of indigenous understanding of the river and its behavior.

However, geological mapping and monitoring are needed to identify fault lines and areas liable to seismic activity – local knowledge cannot manage this. Scientific monitoring and forecasting of cyclones offer a far more reliable basis for planning evacuation than local understanding of precursors. It is also unrealistic to expect indigenous strategies to be able to cope with extreme events. A massive earthquake will overwhelm most indigenous construction techniques, for example, just as repeated years of drought will exhaust communities' food and cash reserves, while social support structures can break down under the pressure of the struggle for scarce resources. Traditional coping mechanisms may also be inadequate for events that were not anticipated, and of which there is no previous experience, such as the HIV/AIDS epidemic.

6.10 Change

Indigenous knowledge and coping strategies are also affected by wider developments in the economy and society, such as changes in land use caused by population expansion or shifts in patterns of land ownership.

In many places, traditional knowledge of biodiversity, of seed varieties that are resistant to drought and other climatic pressures, has been lost because of the promotion of new 'improved' varieties or even alternative crops by government agricultural extension agents. In addition, governments' systems for dealing with crisis can marginalise or damage local coping mechanisms.

6.11 Invisibility

It is a major challenge to identify which coping strategies are effective or do not work well, and why. Local knowledge and coping mechanisms are often invisible to outsiders. As with local perceptions of risk, considerable effort may be needed on the part of outsiders to identify and understand them. This is often difficult for those whose class, upbringing and education have taught them to denigrate indigenous and traditional knowledge as 'primitive'.

It is also important to find out who in the community possesses indigenous knowledge of this kind, and who does not. Where the holders of such knowledge are themselves marginal or less visible within communities – for instance, women or older people – this can be challenging.

Where people are changing or adapting coping strategies rapidly in response to changing events, it may be even harder for outsiders to spot what is going on. This is all the more reason for building up a close relationship with communities during normal times in order to gain a full understanding of how they cope with crises. But there is also a potential for conflict between traditional and modern knowledge systems and cultures, which is clearly linked to power relationships in society.

'Experts' in positions of authority do not like to be challenged. For instance, the revival of traditional water conservation methods in India has come into conflict with local officials' efforts to demolish unauthorized water-harvesting structures built by communities and NGOs.

6.12 Conclusion

In the above part I have tried my level best to show the relationship between indigenous knowledge & disaster preparedness of the char people. We can see how the people of char land use their local/indigenous knowledge while coping up with the natural disasters like flood and river erosion. In the following chapter I will provide some recommendations which I have collected from the interview from the char people of Kurigram district.

Chapter 7

Recommendations from local people

7.1 Introduction

In this chapter I have accumulated few recommendations from the local people of the char land of Kurigram district and written down to get the better understanding of using the local knowledge for the benefit of the poor people of char land.

7.2 Importance of participatory approach

Popular or community participation can be broadly understood as the 'active involvement of people in making decisions about the implementation of processes, programmes and projects which affect them'. Community participation is being encouraged in many areas of development, including disaster management, but practical guidance remains relatively limited. In humanitarian circles, though, the relevance of participation is more questionable – at least in some contexts.

7.2.1 Participatory approaches are valuable in disaster management for the following reasons

- They enable people to explain their vulnerabilities and priorities, allowing problems to be defined correctly and responsive measures to be designed and implemented
- The principal resource available for mitigating or responding to disasters is people themselves and their local knowledge and expertise.
- Participatory work takes a multi-track approach, combining different activities, disasters and disaster phases. It is therefore well placed for dealing with the complexity of disasters and the diversity of factors affecting people's vulnerability to them.
- The process of working and achieving things together can strengthen communities. It reinforces local organisation, building up confidence, skills, capacity to cooperate, awareness and critical appraisal. In this way, it increases people's potential for

reducing their vulnerability. It empowers people more generally by enabling them to tackle other challenges, individually and collectively.

- Participatory risk reduction initiatives are likely to be sustainable because they build on local capacity, the participants have 'ownership' of them, and they are more likely to be compatible with long-term development plans.
- Community participation in planning and implementing projects accords with people's right to participate in decisions that affect their lives. It is therefore an important part of democratisation in society, and is increasingly demanded by the public.
- Participatory approaches may be more cost-effective, in the long term, than externally-driven initiatives, partly because they are more likely to be sustainable and because the process allows ideas to be tested and refined before adoption.
- External agents cannot cope alone with the enormous risks facing vulnerable populations. Local people can bring a wealth of resources, especially knowledge and skills, to help reduce risk.
- Working closely with local people can help professionals to gain a greater insight into the communities they seek to serve, enabling them to work more effectively and produce better results.

7.3 Approaches to participation can be grouped into two main categories:

1. Guided participation (also known as instrumental participation)
2. People-centred participation (also known as transformative participation)

This is admittedly an oversimplification. Furthermore, individual approaches may contain elements of guided and people-centred participation.

7.3.1 Guided participation

Guided participation seeks to include people in improvement projects, mostly in implementation and sometimes planning, but the projects are still initiated, funded and ultimately controlled by professional planners from outside the community. The

planners determine the level of popular participation. The outside agents involved range from international agencies through different tiers of government to NGOs. Guided participation covers a wide range of interventions, from work that is essentially community-focused to government-centred programmes.

Early-warning and response systems to rapid-onset disasters such as cyclones are one example of guided participation in the disaster reduction context. These require community participation in their operation and local-level targeting (e.g. transmitting warnings, organising evacuations, handing out

Relief supplies), but usually are designed by disaster managers and based on centralised decision-making.

Another example is housing programmes introducing safe building techniques where technologies are developed externally in laboratories or test sites before being handed over to communities by training local builders and producing public information materials. In this case, community participation is limited to builders receiving training, who are then expected to take the programme forward.

Within the category of guided participation, a distinction should be made between participation solely in implementing project activities, and participation in planning. In the former, community participation may be limited to undertaking prescribed tasks (e.g. a food-for-work programme following a disaster).

7.3.2 People-centred participation

People-centred participation addresses issues of power and control. Its view is much wider than the technical and managerial aspects of programmes and projects. It is concerned with the nature of the society in which these programmes and projects are developed. It aims at the empowerment of communities. People-centred participation is founded on the belief that ordinary people are capable of critical reflection and analysis, and that their knowledge is relevant and necessary. In countries where

ordinary people are excluded from decision-making and political discussion, or are discouraged from taking part, the importance of participation in giving them a voice may be magnified.

Participation should empower individuals and communities by involving them in:

- defining problems and needs;
- deciding solutions to them;
- implementing agreed activities to achieve those solutions; and
- evaluating the results.

They must also share the benefits of the initiatives. Participation should enable those who are usually the most vulnerable and marginalised within their community to be heard and have their due influence on decision-making.

Disaster specialists have been slower to take to participatory approaches than their colleagues in development. This is largely due to the history, character and culture of disaster work, with its command-and-control mentality, blueprint planning, technocratic bias and disregard for vulnerable communities' knowledge and expertise. Literature on disasters can conceal this, especially where it is produced by those involved in disaster reduction activities. After the flood in Kurigram in 2004, it seemed that nearly every agency involved in reconstruction claimed that local communities were participants in the reconstruction programmes. However, off the record some of the people working there challenged this. The tendency to use the label, but not the substance, of 'participation' is widespread, in development as well as disaster work.

7.4 Who participates, and why?

In disaster reduction, the aim is to enable communities to protect themselves more effectively against disasters. Participation is a means to this end. To the extent that it can empower and thereby mobilise the community *collectively*, it will succeed. If only some parts of the community are involved in a participatory programme, its impact

will be limited at best, it is likely to overlook those most in need, and in some circumstances it may lead to community fragmentation and hence to failure.

7.5 Conclusion

The above are few recommendations given by the local people of the char land. The foremost important recommendation from almost everybody was using participatory approach before establishing any new system in the community which will be helpful for both the parties. The following chapter will be the concluding chapter of this research paper.

Chapter 8

Conclusion

8.1 Introduction

The purpose of this report is to re-affirm the importance of accounting for local knowledge in disaster risk reduction by presenting a general framework through which to understand local knowledge on disaster preparedness based on a literature review. The literature review and related framework revealed the following.

- Despite evidence since the early 1970s, at least, that local knowledge and practices can help implementing organisations to improve their disaster preparedness activities, local knowledge and practices are marginalized from the mainstream disaster literature and within institutions working in disaster management – and this has been the case in the char areas of Bangladesh as elsewhere around the world both in developing and developed countries.

Key factors that have prevented the use of local knowledge include historical factors (e.g., the legacies of colonialism), ideological factors (e.g., the beliefs that conventional or scientific knowledge is 'superior'), institutional factors (e.g., it is difficult to identify and use local knowledge and practices because of their 'invisibility', complexity, diversity, and changeability), political factors (e.g., natural disasters and disasters have been conceived primarily as an issue pertaining to national defense and security), economic factors (e.g., the impact of multiple stresses in a context of rapid change render some local knowledge and practices inappropriate or inaccessible over time), and geographical and temporal factors (e.g., distance management).

8.2 Opening the debate

To what extent is the latest work on local knowledge and related participatory disaster management approaches not as vulnerable to marginalisation or co-opting into

national and international disaster management strategies? How can we reverse the process of marginalisation of local knowledge and practices from mainstream disaster literature and within institutions working in disaster management?

- Local knowledge and practices are complex adaptive responses to internal and external change. Combined with conventional knowledge and understood in the wider context of sustainable development, they have a potentially valuable role to play in disaster risk reduction.

A local knowledge system is not only composed of what people know but also of what people do (practices) and believe in (beliefs, values, and worldviews). Local knowledge and practices are being transformed all the time through the influence of power relations both within and outside the community and the way disasters (in combination with exogenous and endogenous perturbations and responses) are cascading down across different scales. As such local knowledge and practices need to be understood as adaptive responses to internal and external changes that increase, or not, disaster preparedness at the local level. In order to identify local knowledge on disaster preparedness, one should focus at least on four key aspects of local knowledge: peoples' ability to observe their local surroundings, anticipation of environmental indicators, adaptation strategies, and people's ability to communicate about natural disasters within the community and between generations. Finally, the ability a community has to prepare itself for disaster preparedness should be understood in the broad context of livelihood security and sustainability and building community resilience in the long term. Focusing on local knowledge and practices can help understand local contexts and needs that influence how people perceive and respond to natural disasters, risks, and disasters. Local knowledge can provide information related to local environmental variability and specificities; local perceptions of natural disasters; risk tradeoffs in the context of multiple stresses; vulnerable groups and individuals; the local elite and power relations; and changes in people's vulnerability to natural disasters over time. Examples of potential applications of local knowledge in disaster preparedness include accounting for local advice about safe locations, construction sites (buildings and roads), combining local knowledge with conventional knowledge for disaster mapping, surveys and other

inventories in order to verify information, adapting communication strategies to local understanding and perceptions, and integrating local values into decision-making processes.

8.3 Opening the debate

How to make use of local knowledge in disaster preparedness? How can local knowledge and practices improve disaster preparedness projects and vice versa? How to strengthen existing coping strategies for disaster preparedness? How to strengthen the role of local government and community-based organisations in disaster risk reduction and improve their ways of communication and active interaction?

- Recognising and respecting local knowledge and practices empowers local communities. While not all local knowledge, practices, and beliefs are relevant, they always need to be taken into account to ensure project acceptance and sustainability.

Understanding local knowledge and practices can help identify what can be promoted at local level and how to foster people's participation to ensure the support of local knowledge and practices for external action. Solutions in disaster management need to go beyond the dichotomy between local versus state management levels and to integrate cross-scale institutional linkages. Due to changes in the education system and the growing influence of the west, among other things, communities themselves need to be convinced that some of their local knowledge and practices are of relevance to disaster preparedness. The current systems of education should be reconsidered in order to clearly link local communities with schools so that school curriculum are adapted to local needs and realities and incorporate and foster local knowledge and practices. The focus on local knowledge and practices helps to identify and capitalize upon people's existing strengths and local institutions (instead of creating parallel institutions). In the context of rapid change and multiple stresses such as complex, changing, and growing disasters, the extent to which local knowledge and practices actually contribute to improving disaster preparedness at the local level or not is not white or black. We cannot afford to ignore any knowledge or

potential low-cost strategy which might improve survival and mitigate property losses.

8.4 Opening the debate

How can communities themselves gain/regain confidence in their own knowledge system and consolidate it as an effective tool? What forms of community-based action are likely to be effective for improved disaster preparedness? How can external organisations help the communities to consolidate their knowledge system on an equal basis and as an effective tool for disaster preparedness? What kinds of structures of governance at the local level can promote local knowledge?

- There are many challenges to the documentation and use of local knowledge in disaster preparedness, and they can only be resolved through respect, understanding, and reflexivity as well as through creative and innovative solutions. Best practices at the local level in the context of disaster risk reduction that capitalise on local strengths need to be up-scaled.

Ultimately, the use of local knowledge raises ethical and practical questions about social justice, because local knowledge can be used against the people themselves and because it can be used also as an umbrella to mask what still remains 'business as usual'. Innovative initiatives at the local level are happening but they are scattered, fragmented, and often not documented. Lessons learned from such initiatives should be documented and up scaled to foster creative solutions in this field. Based on the assumption that different things can be done better on different scales, depending on the nature and type of natural disasters, for example, partnerships among local government, private sector, non-government organisations, and community groups should be explored.

Every char people know one thing from their birth and that is they are not settlers to any particular area of land. They have to fight continuously with the river by moving again and again from one place to another. And with addition to this the problem of

disaster like flood, drought, and river erosion are putting enormous pressure on the life of char people of Kurigram.

I have only tried to document how the poor people of the char area with the help of their local traditional knowledge are coping with disaster continuing their livelihood.

8.5 Conclusion

There will always be a dilemma whether the intellectual group will except and give importance to the local people's knowledge in the disaster preparedness. But this research has shown that despite all the problems and contradiction there is no way we can neglect the indigenous/local knowledge while preparing for the disaster.

Glossary

- **Capacity** – A combination of all the strengths and resources available within a community, society, or organisation that can reduce the level of risk, or the effects of a disaster.
- **Disaster** – A serious disruption of the functioning of a community or a society causing widespread human, material, economic, or environmental losses which exceed the ability of the affected community or society to cope using its own resources.
- **Disaster risk reduction (disaster reduction)** – The conceptual framework of elements considered with the possibilities to minimise vulnerabilities and disaster risks throughout a society, to avoid (prevention) or to limit (mitigation and preparedness) the adverse impacts of disasters, within the broad context of sustainable development.
- **Disaster** – A potentially damaging physical event, phenomenon or human activity that may cause the loss of life or injury, property damage, social and economic disruption or environmental degradation.
- **Mitigation** – Structural and non-structural measures undertaken to limit the adverse impact of natural disasters, environmental degradation and technological disasters.
- **Preparedness** – Activities and measures taken in advance to ensure effective response to the impact of disasters, including the issuance of timely and effective early warnings and the temporary evacuation of people and property from threatened locations.
- **Resilience/resilient** – The capacity of a system, community or society potentially exposed to disasters to adapt, by resisting or changing in order to reach and maintain an acceptable level of functioning and structure. It is determined by the degree to which the social system is capable of

organising itself to increase its capacity for learning from past disasters for better future protection and to improve risk reduction measures.

- **Risk** – The probability of harmful consequences, or expected losses (deaths, injuries, property, livelihoods, economic activity disrupted or environmental damaged) resulting from interactions between natural or human-induced disasters and vulnerable conditions. Conventionally risk is expressed by the notation $\text{Risk} = \text{Disasters} \times \text{Vulnerability}$. Some disciplines also include the concept of exposure to refer particularly to the physical aspects of vulnerability. A disaster is a function of the risk process. It results from the combination of disasters, conditions of vulnerability and insufficient capacity or measures to reduce the potential negative consequences of risk.
- **Risk assessment or analysis** – A methodology to determine the nature and extent of risk by analysing potential disasters and evaluating existing conditions of vulnerability that could pose a potential threat or harm to people, property, livelihoods and the environment on which they depend.
- **Vulnerability** – The conditions determined by physical, social, economic and environmental factors or processes, which increase the susceptibility of a community to the impact of disasters.

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